

AMENDMENT UNDER 37 C.F.R. §1.111
U.S. Application No. 10/083,362
Attorney Docket No. Q68702

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A video processing device comprising:
correction amount obtaining means for obtaining a correction amount from sequentially applied moving images, [[and]]
image correcting means for subjecting an input moving image to quality improving correction processing based on a correction amount obtained by said correction amount obtaining means, and
correction amount update determining means for giving an instruction to update said correction amount either when a lapse of a fixed time is detected in which a number of frames from a frame image whose correction amount is lastly updated to a current frame image exceeds a predetermined value, or when a cut point is detected which is indicative of switching of a scene in said moving images based on a change of a feature amount obtained from each frame image.

2. (currently amended): The video processing device as set forth in claim 1, further comprising:
image input means for obtaining [[a]] said frame image from sequentially applied moving images and outputting the image to said correction amount obtaining means, wherein

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said correction amount obtaining means obtains said correction amount from said frame image and said image correcting means subjects said frame image to quality improving correction processing based on said correction amount.

3. (currently amended): [[The]] A video processing device ~~as set forth in claim 1,~~
~~further comprising:~~

correction amount obtaining means for obtaining a correction amount from sequentially applied moving images,

image correcting means for subjecting an input moving image to quality improving correction processing based on a correction amount obtained by said correction amount obtaining means,

correction region cutting-out means for, before said moving image is subjected to correction processing, cutting out a region to be corrected from the moving image in question, and

image composing means for combining a region to be corrected which is cut out by said correction region cutting-out means and a region not to be corrected which is a remainder left after the region to be corrected in question is cut out.

4. (currently amended): [[The]] A video processing device ~~as set forth in claim 2,~~
~~further comprising:~~

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correction amount obtaining means for obtaining a correction amount from sequentially applied moving images,

image correcting means for subjecting an input moving image to quality improving correction processing based on a correction amount obtained by said correction amount obtaining means,

image input means for obtaining said frame image from sequentially applied moving images and outputting the image to said correction amount obtaining means, wherein said correction amount obtaining means obtains said correction amount from said frame image and said image correcting means subjects said frame image to quality improving correction processing based on said correction amount, and

correction amount change limiting means for limiting an amount of change between a correction amount of a current frame image obtained by said correction amount obtaining means and a stored correction amount of a preceding frame image.

5. (currently amended): [[The]] A video processing device as set forth in claim 2, further comprising:

correction amount obtaining means for obtaining a correction amount from sequentially applied moving images,

image correcting means for subjecting an input moving image to quality improving correction processing based on a correction amount obtained by said correction amount obtaining means,

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image input means for obtaining said frame image from sequentially applied moving images and outputting the image to said correction amount obtaining means, wherein said correction amount obtaining means obtains said correction amount from said frame image and said image correcting means subjects said frame image to quality improving correction processing based on said correction amount,

lapse of fixed time detecting means for counting the number of frames from a frame image whose said correction amount is lastly updated to a current frame image to determine whether the number of frames exceeds a fixed value, and

correction amount update determining means for giving an instruction to update said correction amount when said lapse of fixed time detecting means determines that a fixed time has elapsed.

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6. (currently amended): [[The]] A video processing device as set forth in claim 2, further comprising:

correction amount obtaining means for obtaining a correction amount from sequentially applied moving images,

image correcting means for subjecting an input moving image to quality improving correction processing based on a correction amount obtained by said correction amount obtaining means,

image input means for obtaining said frame image from sequentially applied moving images and outputting the image to said correction amount obtaining means, wherein

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said correction amount obtaining means obtains said correction amount from said frame image
and said image correcting means subjects said frame image to quality improving correction
processing based on said correction amount, and

cut point detecting means for detecting a cut point indicative of switching of a scene in said moving image based on a change of a feature amount obtained from each frame image, and correction amount update determining means for giving an instruction to update said correction amount when said cut point detecting means detects said cut point.

7. (currently amended): [[The]] A video processing device as set forth in claim 2,
further comprising:

correction amount obtaining means for obtaining a correction amount from
sequentially applied moving images,

image correcting means for subjecting an input moving image to quality
improving correction processing based on a correction amount obtained by said correction
amount obtaining means,

image input means for obtaining said frame image from sequentially applied
moving images and outputting the image to said correction amount obtaining means, wherein
said correction amount obtaining means obtains said correction amount from said frame image
and said image correcting means subjects said frame image to quality improving correction
processing based on said correction amount,

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lapse of fixed time detecting means for counting the number of frames from a frame image whose said correction amount is lastly updated to a current frame image to determine whether the number of frames exceeds a fixed value,

cut point detecting means for detecting a cut point indicative of switching of a scene in said moving image based on a change of a feature amount obtained from each frame image, and

correction amount update determining means for giving an instruction to update said correction amount either when detection of a lapse of a fixed time is made by said lapse of fixed time detecting means or when detection of said cut point is made by said cut point detecting means.

8. (original): The video processing device as set forth in 1, wherein
said correction amount obtaining means includes
correction amount calculating means for calculating n ($n \geq 1$) kinds of arbitrary correction amounts, and
said image correcting means includes
 n kinds ($n \geq 1$) of arbitrary correcting means.

9. (original): The video processing device as set forth in claim 2, wherein
said correction amount obtaining means includes at least one of:

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white balance correction amount calculating means for calculating a white balance correction amount of said moving image,

contrast correction amount calculating means for calculating a contrast correction amount of said moving image,

saturation correction amount calculating means for calculating a saturation correction amount of said moving image,

exposure correction amount calculating means for calculating an exposure correction amount of said moving image,

sharpness correction amount calculating means for calculating a sharpness correction amount of said moving image, and

preferable color correction amount calculating means for calculating a preferable color correction amount indicative of a correction amount required for a preset preferable color in said moving image, and

said image correcting means includes at least one of:

white balance correcting means for conducting white balance correction of said moving image corresponding to said correction amount obtaining means,

contrast correcting means for conducting contrast correction of said moving image,

saturation correcting means for conducting saturation correction of said moving image,

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exposure correcting means for conducting exposure correction of said moving image,

sharpness correcting means for conducting sharpness correction of said moving image, and

preferable color correcting means for conducting said preferable color correction of said moving image.

10. (original): The video processing device as set forth in claim 9, wherein said image correcting means conducts correction with respect to a moving image corrected by the image correcting means at a preceding stage based on a correction amount calculated by said correction amount obtaining means and said correction amount obtaining means calculates said correction amount of a moving image corrected by the image correcting means corresponding to the correction amount obtaining means at a preceding stage.

11. (original): The video processing device as set forth in claim 9, wherein said correction amount obtaining means includes an evaluation region cutting-out means for cutting out an evaluation image region for calculating a correction amount from said frame image.

12. (original): The video processing device as set forth in claim 9, wherein

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said correction amount obtaining means includes
upper limit value adjusting means for comparing a correction amount obtained in
advance and an upper limit value and when the value is larger than said upper limit value,
replacing the value with a predetermined set value.

13. (original): The video processing device as set forth in claim 4, wherein
said correction amount change limiting means includes
change amount calculating means for calculating an amount of change between a
latest correction amount and a correction amount of a preceding frame and change amount
limiting means for limiting an amount of change of said correction amount based on a maximum
change range.

14. (original): The video processing device as set forth in claim 6, wherein
said cut point detecting means is structured to consider a result of comparison of a
color histogram generated based on color information of each pixel of said moving image which
is conducted on a frame basis as a feature amount and detect a cut point of said moving image
based on a change of the feature amount.

15. (original): The video processing device as set forth in claim 14, wherein

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said cut point detecting means is structured to, at the time of generating said color histogram from said moving image, generate said color histogram after thinning out the image at fixed intervals.

16. (original): A video processing device comprising:

image input means for obtaining a frame image from sequentially applied moving images, and

cut point detecting means for detecting a cut point indicative of switching of a scene in said moving image based on a change of a feature amount obtained from each frame image.

17. (original): The video processing device as set forth in claim 16, wherein

said cut point detecting means is structured to consider a result of comparison of a color histogram generated based on color information of each pixel of said moving image which is conducted on a frame basis as a feature amount and detect a cut point of said moving image based on a change of the feature amount.

18. (original): The video processing device as set forth in claim 17, wherein

said cut point detecting means is structured to, at the time of generating said color histogram from said moving image, generate said color histogram after thinning out the image at fixed intervals.

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19. (currently amended): A video display device comprising:
moving image correction amount obtaining means for obtaining N ($N \geq 1$) kinds
of correction amounts from sequentially applied moving images,
image correcting means for conducting N ($N \geq 1$) kinds of quality improving
corrections with respect to said moving image based on a correction amount obtained by said
moving image correction amount obtaining means, [[and]]

image display means for displaying a moving image corrected by said image
correcting means, and

correction amount update determining means for giving an instruction to update
said correction amounts either when a lapse of a fixed time is detected in which a number of
frames from a frame image whose correction amount is lastly updated to a current frame image
exceeds a predetermined value, or when a cut point is detected which is indicative of switching
of a scene in said moving images based on a change of a feature amount obtained from each
frame image.

20. (currently amended): A video processing method comprising the steps of:
obtaining a correction amount from sequentially applied moving images, [[and]]
conducting quality improving correction with respect to said applied moving
image based on the obtained correction amount, and
updating said correction amount when a lapse of a fixed time is detected in which
a number of frames from a frame image whose correction amount is lastly updated to a current

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frame image exceeds a predetermined value, or when a cut point is detected which is indicative of switching of a scene in said moving images based on a change of a feature amount obtained from each frame image.

21. (original): The video processing method as set forth in claim 20, comprising the steps of:

obtaining a correction amount from each frame image forming sequentially applied moving images, and
conducting quality improving correction with respect to said frame image based on the obtained correction amount.

22. (currently amended): [[The]] A video processing method ~~as set forth in claim 20~~, comprising the steps of:

obtaining a correction amount from sequentially applied moving images,
conducting quality improving correction with respect to said applied moving
image based on the obtained correction amount, and
updating a correction amount for every N frames ($N \geq 1$).

23. (currently amended): [[The]] A video processing method ~~as set forth in claim 20~~, comprising the steps of:

obtaining a correction amount from sequentially applied moving images,

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conducting quality improving correction with respect to said applied moving image based on the obtained correction amount, and

checking said input moving image on a frame basis and when a cut point indicative of switching of a scene in said input moving image is detected, updating a correction amount.

24. (currently amended): [[The]] A video processing method ~~as set forth in claim 20,~~ comprising the steps of:

obtaining a correction amount from sequentially applied moving images,
conducting quality improving correction with respect to said applied moving image based on the obtained correction amount,

updating a correction amount for every N frames ($N \geq 1$), and
checking said input moving image on a frame basis and when a cut point indicative of switching of a scene in said input moving image is detected, updating a correction amount.

25. (original): The video processing method as set forth in claim 20, comprising the steps of:

obtaining n ($n \geq 1$) kinds of arbitrary correction amounts at the time of obtaining said correction amount from said input moving image, and

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conducting n ($N \geq 1$) kinds of arbitrary quality improving corrections with respect to said input moving image based on the obtained correction amount.

26. (original): The video processing method as set forth in claim 21, wherein said correction amount obtaining step includes at least one of the steps of: calculating a white balance correction amount of said moving image, calculating a contrast correction amount of said moving image, calculating a saturation correction amount of said moving image, calculating an exposure correction amount of said moving image, calculating a sharpness correction amount of said moving image, and calculating a preferable color correction amount indicative of a correction amount required for a preset preferable color in said moving image, and

said quality improving correction conducting step includes at least one of the steps of:

conducting white balance correction of said moving image corresponding to said correction amount obtaining step, conducting contrast correction of said moving image, conducting saturation correction of said moving image, conducting exposure correction of said moving image, conducting sharpness correction of said moving image, and conducting said preferable color correction of said moving image.

27. (original): The video processing method as set forth in claim 26, wherein

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at said quality improving correction conducting step, correction is conducted with respect to a moving image corrected at the step of conducting quality improving correction at a preceding stage based on a correction amount calculated at said step of obtaining a correction amount, and

at said correction amount obtaining step, said correction amount is calculated from a moving image corrected at said step of conducting quality improving correction corresponding to the step of obtaining a correction amount at a preceding stage.

28. (original): The video processing method as set forth in claim 26, further comprising the step of

limiting an amount of change between the obtained correction amount of a current frame and a stored correction amount of a preceding frame.

29. (original): The video processing method as set forth in claim 26, further comprising the steps of:

cutting out an evaluation image region necessary for obtaining said correction amount from said frame image, and

obtaining said correction amount from the cut-out evaluation image.

30. (original): The video processing method as set forth in claim 23, further comprising the step of,

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at the detection of said cut point, considering a result of comparison of a color histogram generated based on color information of each pixel of said ~~frame moving~~ image which is conducted on a frame basis as a feature amount and detecting a cut point of the moving image based on a change of the feature amount.

31. (original): The video processing method as set forth in claim 30, further comprising the step of,

when detecting said cut point, at the time of generating said color histogram from said frame image, generating said color histogram after thinning out the image at fixed intervals.

32. (currently amended): [[The]] A video processing method ~~as set forth in claim 20~~, comprising the steps of:

obtaining a correction amount from sequentially applied moving images,
conducting quality improving correction with respect to said applied moving
image based on the obtained correction amount,

when a moving image partly flows on such a screen as a screen of a personal computer, before subjecting said moving image to correction processing, cutting out a region to be corrected from the moving image in question,

subjecting the cut-out image to be corrected to image correction, and

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combining said region to be corrected which is subjected to image correction and a region not to be corrected which is a remainder left after the region to be corrected in question is cut out to output the combined image.

33. (original): A video processing method comprising the steps of:
 - obtaining a frame image from sequentially applied moving images, and
 - detecting a cut point indicative of switching of a scene in said moving image based on a change of a feature amount obtained from each frame image.
34. (original): The video processing method as set forth in claim 33, wherein at said cut point detecting step, a result of comparison of a color histogram generated based on color information of each pixel of said moving image which is conducted on a frame basis is considered as a feature amount and a cut point of said moving image is detected based on a change of the feature amount.
35. (original): The video processing method as set forth in claim 34, wherein at said cut point detecting step, at the time of generating said color histogram from said moving image, said color histogram is generated after thinning out the image at fixed intervals.

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36. (original): A video processing program for controlling a computer to execute video processing, comprising the functions of:

obtaining at least one correction amount from moving images sequentially applied to the computer,

comparing the obtained correction amount with a correction amount obtained from at least one of preceding past frames to suppress a change in correction amount, and

subjecting a frame image to quality improving correction based on the suppressed correction amount.

37. (original): A video processing program for controlling a computer to execute video processing, comprising the functions of:

obtaining at least one correction amount from moving images sequentially applied to the computer,

based on a change of a feature amount obtained from a frame image of an input moving image, detecting a cut point indicative of switching of a scene in the moving image in question,

comparing the obtained correction amount with a correction amount obtained from at least one of preceding past frames and suppressing an amount of change in correction amount in consideration of existence/non-existence of a cut point, and

subjecting the frame image to quality improving correction based on the suppressed correction amount.

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38. (original): A video processing program for controlling a computer to execute video processing, comprising the functions of:

obtaining a frame image from sequentially applied moving images, and
detecting a cut point indicative of switching of a scene in said moving image
based on a change of a feature amount obtained from each frame image.

39. (new): The video processing device as set forth in claim 1, further comprising:
correction region cutting-out means for, before said moving image is subjected to correction processing, cutting out a region to be corrected from the moving image in question,
and

image composing means for combining a region to be corrected which is cut out by said correction region cutting-out means and a region not to be corrected which is a remainder left after the region to be corrected in question is cut out.

40. (new): The video processing method as set forth in claim 20, further comprising the steps of:

when a moving image partly flows on such a screen as a screen of a personal computer, before subjecting said moving image to correction processing, cutting out a region to be corrected from the moving image in question,
subjecting the cut-out image to be corrected to image correction, and

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combining said region to be corrected which is subjected to image correction and
a region not to be corrected which is a remainder left after the region to be corrected in question
is cut out to output the combined image.